

my readers will have derived some small insight into the wonderful molecular mechanism which gives rise to the beautiful colours and crosses that are revealed by the microscope with the aid of polarised light.

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### Hop-Pickers' Ophthalmia.\*

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FOR the past six years, during the latter part of August and throughout the month of September, cases of an acute form of ophthalmia have occurred in Kent among the hop operatives.

A peculiarity of the disease lies in the apparent immunity of men; women and children are more intimately associated with the actual handling of the hop-cones in plucking them from the bine. Men engaged in the hop industry are, however, subject to the disorder. The disease is associated with no particular plantation, growth of hops, encampment, or village. It is mostly prevalent at the time of the maturity of the catkins only, and does not appear to be infectious. All, whether "home-pickers" or strangers, appear to suffer equally from the disorder, which appears to partake of a partly mechanical origin.

In two cases which came under the writer's notice, the patients positively affirmed that the advent of their symptoms followed shortly after an accidental rubbing of their eyes with hop-soiled hands. I made observations of the operatives whilst actually engaged in hop-picking, and noticed that the women, whilst bending over the bines, frequently applied their hands to their foreheads to brush aside the hair from the face. A woman with a much-inflamed eye who came to the hospital maintained that it came on shortly after rubbing "some of the stuff from the hops" into her eyes from her hands.

Patients complain of an acute smarting pain, which becomes

\* From *British Medical Journal*, May 13, 1893. Our thanks are due to the Editor for kindly lending the electros.

rapidly worse. This stinging sensation I have known to affect the skin as well as the eye after a stroke from a hop-bine alone. The hands are often much soiled and blackened with the resinous matter from the hops, and the odour of the volatile oils is very noticeable about the patients' clothing.

The usual mode of introduction of an irritant from the hop appears to be by the hands. The older agricultural labourers say that, prior to the introduction of lever presses for compressing the dried hops in the "pockets," this work was performed by treading



Fig. 68.—Hair-like appendages upon the bracts of the hop-catkins, magnified. them in with the feet. This created a considerable quantity of dust, and it was not an unusual occurrence for their eyes to become affected from the hop-dust. Since the application of these presses, this inconvenience no longer occurs.

#### MICROSCOPICAL EXAMINATION OF THE HOP PLANT.

On examining the bracts, leaves, and bine, thorn-like, hairy processes are seen on all, those upon the bine being larger and

coarser than those upon the leaves and bracts. These sharply-pointed processes are scattered all over the surface of the bracts, with the apices of each spine directed towards the distal end of the bract as regards its point of attachment to the pedicel. The spines on the leaves are confined more to the edges, and do not appear to be so hard and dense and sharp as those upon the bracts. In Fig. 70 some of the characteristics of these spinous processes are shown.



Fig. 69.—Spine-shaped hairs of the hop-bracts. *a*, Entire spinous process ; *b*, fractured ; *c*, showing hollow central canal (transverse section).

In staining with various dyes, the outer portion of the hair accepts the staining re-agents less readily than the softer internal parts. When for any reason they are fractured between the faceted point of attachment to the bract and their pointed extremity, the fractured ends are not unlike those of a mature bone or a dry branch of a tree, with a less dense central portion. The bracts are also covered with glandular structures and lupulinic grains. Emphasis is placed on the fact that these hairs are denser

and sharper in structure in the mature hop-catkin, because in this fact lies, I believe, the explanation of this disease of hop-pickers, and one of the reasons why it is most prevalent at the hop-harvest.



Fig. 70.—A microphotograph of the spines upon the bracts of the hop.

#### PROBABLE MODE OF PRODUCTION OF THE OPTHALMIA.

Belonging as the *Humulus lupulus* does to the same family as the *Urtica urens*, or common stinging nettle, and the order URTICACEÆ (which also includes some very severe stinging foreign specimens), and knowing that the hop-plant possesses those sharply-pointed appendages, is it not probable that this painful affection, which is produced immediately and often continues to become worse, is explained by the introduction, either by movements of air, by gravitation, or upon the hands of the hop-pickers, of some of those spinous processes of the hop-plant, which, becoming impacted into the conjunctiva or cornea, form the initial cause of the disease? It is also probable that upon them the volatile and resinous matters, etc., of the hop itself, or even



micro-organisms, are introduced, which may vary and modify the subsequent features of the trouble. The principal signs are primarily those of a mechanical irritant in this disease. The employment among the operatives of glass protective spectacles,



Fig. 71.—A microphotograph of the spinous hairs of the hop-plant.

and the use of gloves during the operation of hop-picking, to be abandoned at once on the termination of the work, together with more personal cleanliness, are most important prophylactic measures, though difficult to enforce.

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The following is given in *Science* (April 28th, 1893) as the *best* formula for Müller's fluid :—

Bichromate of Potassium ...	...	2 per cent.
Sulphate of Sodium ...	...	2 "
Water ...	...	96 "

In practice it is convenient and sufficiently exact to dissolve 2 grammes of each salt in 1,000 cubic centimetres of water.

## The Leucosporæ.\*

IN this section of the Agaricinæ, the spores are typically white, although in some species there is a more or less decided but very faint tinge of yellow or pink. The commonest spore-form is elliptical and with a smooth epispore, although in the genera *Lactarius*, *Rassula*, and *Laccaria*, the spores are subglobose and minutely warted or echinulate. This section contains more species than all the other sections of the AGARICINÆ added together, and, as would be expected, presents the most complete sequence in the differentiation of the sporophore. *Lenzites*, with its corky pileus and gills, connects with Polyporeæ through *Dædaleæ*. The genera—characterised by a tough, leathery pileus, that dries up and becomes rigid and persistent, as *Panus*, *Lentinus*, etc.—are but scantily represented in Britain or even in Europe; but on the other hand, are more numerous in the tropics than the fleshy, putrescent genera, which attain their maximum, both in development and numbers, in the north temperate zone.

In the accompanying illustration (for the use of which we beg to thank Messrs. George Bell and Sons), the following species are represented:—

- Fig. 1.—*Hygrophorus Wynnii* and section of same, natural size.  
 „ 2.—*Lactarius blennius*, about one-third natural size, and section of same, natural size.  
 „ 3.—Spores of same,  $\times 400$ .  
 „ 4.—*Cantharellus aurantiacus*, about two-thirds natural size.  
 „ 5.—*Nyctalis asterophora* and section, two-thirds natural size.  
 „ 6.—*Lentinus tigrinus*, about two-thirds natural size.  
 „ 7.—*Panus stypticus*, natural size.  
 „ 8.—*Lenzites flaccida*, two-thirds natural size.  
 „ 9.—Section of same, natural size.  
 „ 10.—*Omphalia telmatia*, small specimen, natural size.  
 „ 11.—Section of same, natural size.  
 „ 12.—*Pleurotus gadinoides*, natural size.  
 „ 13.—Section of same,  $\times 2$ .  
 „ 14.—*Clitocbe ericetorum*, half natural size.  
 „ 15.—Section of same, half natural size.  
 „ 16.—*Xerotus degener*, natural size.  
 „ 17.—*Schizophyllum commune*, natural size.  
 „ 18.—Section of gills of same, showing the split margin.  
 „ 19.—*Trogia crispa*, small specimen, natural size.

\* From the *British Fungus-Flora*, by George Masser (in three vols.). Vol. II. (London: George Bell and Sons. 1893.)